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Carotenoids play an important role as a pro-vitamin A and antioxidants in human health. Dietary factors may influence intestinal absorption of carotenoids from food. The present study was aimed to find out the effect of phospholipids, PC (phosphatidylcholine) and lysoPC (lysophosphatidylcholine) solubilized in mixed micelles on the intestinal absorption of β-carotene and lutein *in vivo*. Mixed micelles were composed of 2.5 mM monooleoyl glycerol, 7.5 mM oleic acid, 12 mM sodium taurocholate, 200 μM β-carotene or lutein and 3 mM phospholipid in phosphate buffer saline. Three groups of mice were fed single doses of β-carotene or lutein solubilized in PC- (PC group), lysoPC- (lysoPC group) and no phospholipid (NoPL group) micelles by gavages. The results of postprandial β-carotene and lutein after gavages at different time intervals (0-9 h) showed that phospholipid in micelles had profound effects on β-carotene and lutein in plasma and liver. No β-carotene or lutein detected in plasma or liver of mice before gavages, whereas, detectable level was observed after β-carotene and lutein ingestion by gavages. The β-carotene response in plasma and liver by the PC-micelles was significantly lower than that of lysoPC-micelles, while no difference was noticed between lysoPC and NoPL-groups. Similarly, the lutein levels in plasma 2 h after gavage and in liver 3 h after gavage were significantly higher in PC groups than in the other groups. The plasma retinyl palmitate level in lysoPC group 3 h after gavage was significantly ($p<0.05$) higher than baseline level, but no difference was observed for those of PC- and NoPL-micelles groups, which indicates that lysoPC enhances the absorption of b-carotene. Area under the plasma b-carotene and lutein response curve (AUC) of lysoPC group was 96.9 % and 41.2 % higher than those of PC group. Similarly, AUC for liver lutein of lysoPC group was 47.2 % higher than that of PC group. No β-carotene detected in liver of PC group. We conclude that the plasma and liver β-carotene and lutein levels are markedly diminished when these carotenoids are ingested with PC-micelles instead of lysoPC-micelles. Finally, the data obtained show that lysoPC may be involved in the enhanced intestinal absorption and conversion of β-carotene into vitamin A.